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Forest Insect and Disease Management

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BIOLOGICAL
EVALUATION R2-77-16

PHOMOPSIS BLIGHT OF JUNIPER
at Bessey Nursery

Nebraska National Forest

JUNE 1977



Rocky Mountain Region

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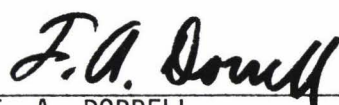
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INTRODUCTION

Phomopsis blight of junipers was reported by Paul Forward, Nurseryman, in 2-0 and 1-0 beds of eastern redcedar and Rocky Mountain juniper at Bessey Nursery during June 1977. On June 14, 1977, Linnea Gillman and Tom Landis examined the beds to determine the extent of the infection. This disease has frequently been a problem in nurseries and can cause total loss of 1-0 seedlings if adequate control measures are not taken. Infected seedlings that are outplanted have a low survival rate and the infection can spread to young foliage of nearby junipers (Peterson 1965).

TECHNICAL INFORMATION

CAUSAL AGENT: *Phomopsis juniperovora* Hahn, Phomopsis blight

HOSTS AFFECTED: *Juniperus virginiana* L., eastern redcedar and *J. scopulorum* Sarg., Rocky Mountain juniper

CAUSAL AGENT BIOLOGY (Peterson and Hodges 1975): The causal agent is a fungus which infects young needles and stems throughout the growing season. Black fruiting bodies (pycnidia, Fig. 1 b, c) on the previous year's infected tissue produce spores (Fig. 1 d) which are distributed by water splash and infect new growth at the beginning of the season. Germination occurs during periods of high humidity, and pycnidia can form in 3 to 4 weeks. The cycle continues through the active growing periods of the juniper.

EXTENT OF OUTBREAK: Two 2-0 blocks and two 1-0 blocks of juniper were examined. Phomopsis blight was found on both ends of a 2-0 block and on the bordering ends of a 1-0 and a 2-0 block. Infection was limited to the margins of the blocks.

METHODS AND RESULTS

A visual estimation of damage was made using the following ratings: (see Fig. 2);

H (heavy damage) = most seedlings with several dead branches, some seedlings dead

M (medium damage) = approximately half of the seedlings with one or more dead branches

L (light damage) = scattered seedlings with dead branches

Damage ratings of M and H were located only at the bed ends (beds run east-west) of Block 3, which is 2-0 juniper. The heavy or medium damage was in the last 20 feet of the beds; the central portion of the block was rated as light damage. Blocks 1, 2, (1-0) and 4 (2-0) received an overall rating of light damage.

Samples of dead and dying branches and seedlings were taken from the areas as shown on the map. The presence of *Phomopsis* blight was determined by microscopic examination of fruiting bodies (pycnidia) found on the dead stems and needles. Other black fungi fruiting on dead tissue were saprophytes; *Alternaria* sp. conidiophores occurred often, and other unidentified species forming black pycnidia occasionally were found. *Phomopsis* blight was positively identified along the bed ends of the 2-0 juniper in Block 3 and in the bed ends of Block 4 (2-0 juniper) and Block 2 (1-0 juniper) that were adjacent to Block 3.

DISCUSSION AND RECOMMENDATIONS

The overall incidence of *Phomopsis* blight in Blocks 1-4 was not severe on June 14, 1977 but the disease can spread rapidly and cause widespread mortality in a nursery if adequate control measures are not taken. The spring of 1977 was very wet (9 inches above average rainfall by June 14) and *Phomopsis* spores germinate readily in high humidity.

The nursery had already initiated the recommended chemical control methods (Otta 1974): Blocks 3 and 4 had received 7 bi-weekly applications of benomyl and Blocks 1 and 2 had received their first application on June 13. Bi-weekly applications were planned for

the rest of the growing season. Also, overhead watering was done early in the day so that the foliage could dry by evening. In addition to spraying with benomyl and watering early in the day, the following measures were suggested:

1. Remove and destroy pockets of heavy infection to reduce the source of inoculum for the rest of the growing season.
2. In the future do not sow juniper next to blocks that are already planted with juniper.
3. Avoid using juniper as windbreaks or ornamentals adjacent to production beds of juniper.
4. Sow juniper in well drained areas.

The control measures in effect by June 14 were probably effective since disease incidence was light in spite of the favorable moisture conditions. Benomyl applications were continued throughout the growing season and by November 1977 Phomopsis blight had not caused noticeable seedling damage.

REFERENCES

1. OTTA, J. E. 1974. Benomyl and thiophante methyl control of Phomopsis blight of eastern redcedar in a nursery. Plant Dis. Reprtr. 58: 476-477.
2. PETERSON, G. W. 1965. Field survival and growth of Phomopsis-blighted and non-blighted eastern redcedar planting stock. Plant Dis. Reprtr. 49: 121-123.
3. PETERSON, G. W. and C. S. HODGES, Jr. 1975. Phomopsis blight of junipers. Forest Pest Leaflet 154. 6 p.

FIGURE 1

PHOMOPSIS BLIGHT OF JUNIPERS

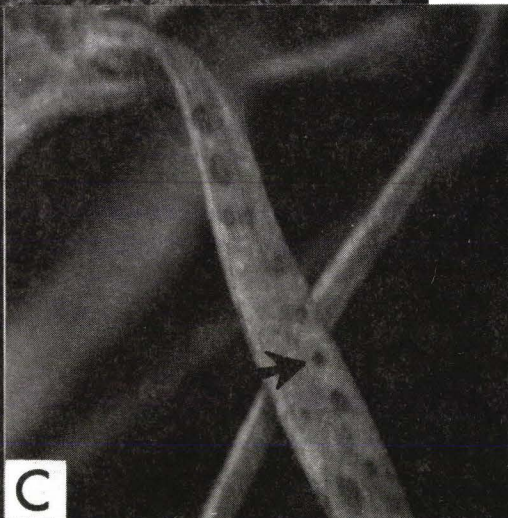
- a) Bed of 2-0 eastern redcedar showing loss.
- b) 2-0 cedar with dead foliage and pycnidia on stem (X 3).
- c) Close-up of infected needle with pycnidia (X 10).
- d) Microscopic view of spore with 2 oil globules (X 5000).



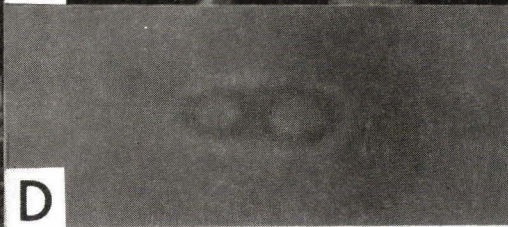
A



B



C



D

Figure 2
BESSEY NURSERY

VISUAL ESTIMATION OF DAMAGE

H = heavy damage: most seedlings with dead branches; some seedlings dead

M = medium damage: not all seedlings with dead branches

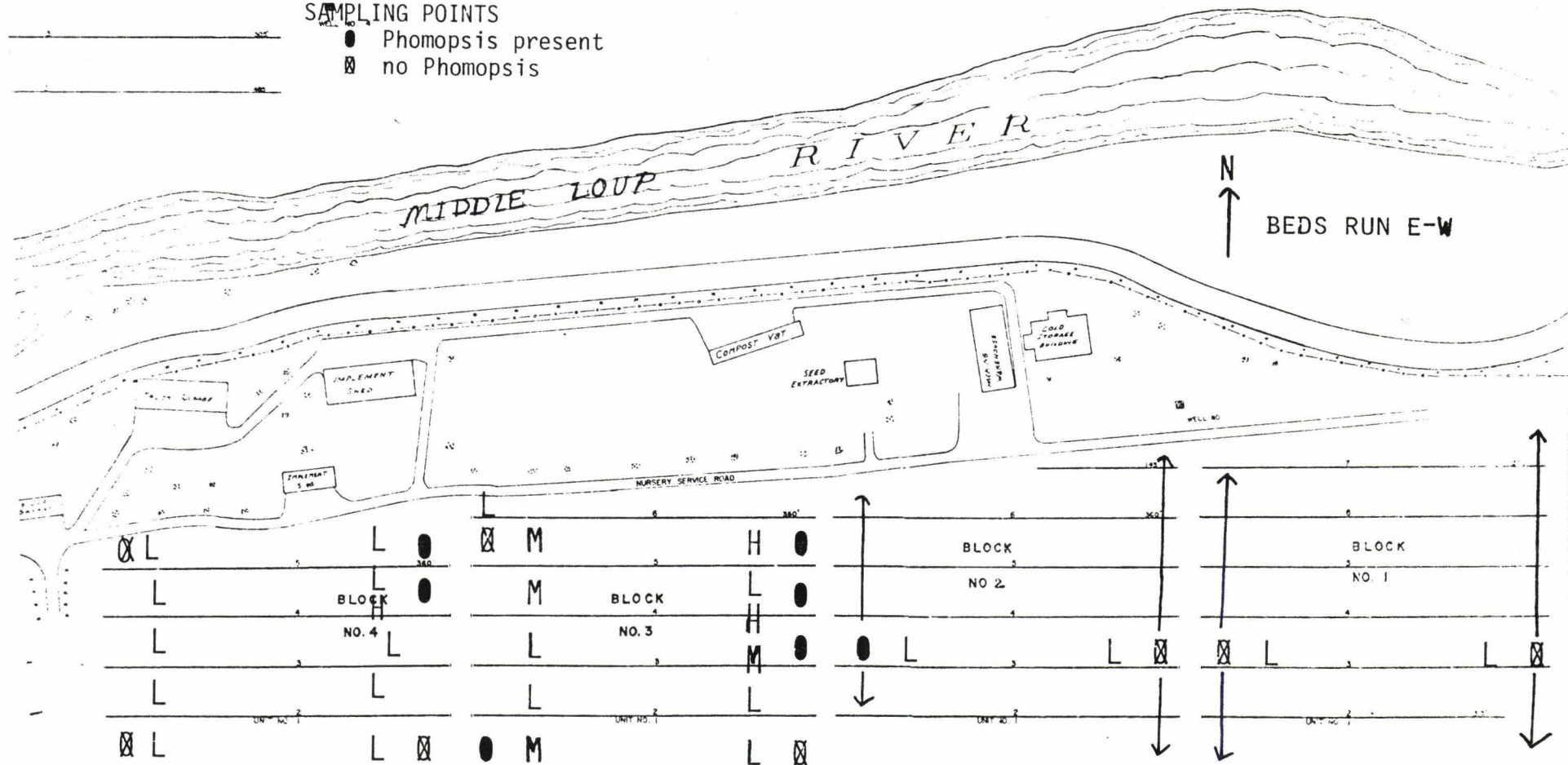
L = light damage: scattered seedlings with dead branches

SAMPLING POINTS

● Phomopsis present

⊠ no Phomopsis

YCK



BLOCK 4 2-0 JUNIPER

BLOCK 3 2-0 JUNIPER

BLOCK 2 1-0 JUNIPER

BLOCK 1 1-0 JUNIPER